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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/566,476	01/31/2006	Kazuhiro Murata	0234-0507PUS1	5098

2292 7590 02/03/2011
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EXAMINER	
SULTANA, NAHIDA	
ART UNIT	PAPER NUMBER
1743	

NOTIFICATION DATE	DELIVERY MODE
02/03/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

mailroom@bskb.com

Office Action Summary	Application No.	Applicant(s)	
	10/566,476	MURATA ET AL.	
	Examiner	Art Unit	
	NAHIDA SULTANA	1743	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *19 November 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4-24 and 35-40* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4-24 and 35-40* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *09 October 2009* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This **Final action** is in response to the amendment received on 11/19/2010, in response to the **non-final action** sent on 07/20/2010.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. **Claims 1, 4-24, 35-40** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

3. Claim 1, is newly amended to state in combination wherein the nozzle inside diameter is 0.01 micron to 8 micron, wherein the diameter of the ejected droplet is 15 micron or less. However, application failed to show having possession of the combination as claimed, where inside diameter is 0.01 to 8 micron and wherein the diameter of the ejected droplet is 15 micron or less. For example, applicant showed 1 micron nozzle giving 4 micron droplet size (see example 3, and all the others), the specification has not shown the combination applied above.

4. The dependent claims are rejected for the same reason as mentioned above.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

- Determining the scope and contents of the prior art.
- Ascertaining the differences between the prior art and the claims at issue.
- Resolving the level of ordinary skill in the pertinent art.
- Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. Claims **1, 4, 6, 8-16, 23-24, 35,** are rejected under 35 U.S. C. 103(a) as being unpatentable over **Danforth et al.** (US patent No. 5, 997, 795) in view of **Sachs et al.** (US Patent No. 5, 807, 437) and in further view of **Gratson** (US Publication 2006/0235105 A1).

For **claims 1, and 35,** Danforth et al. teach:

A method of producing **a three-dimensional structure** (abstract), comprising the steps of: providing a nozzle having needle shape structure (Figure 3-4), and also teaches having interchangeable size and shape of the dispensing head outlet using various orifice sizes and shapes, or interchangeable orifice inserts in the tip of the nozzle (col. 10. lines 30-40; col. 25. lines 35-65); arranging a substrate close to a tip of fluid-ejection body (example Fig. 3. Items 14 (“print head"), 19 ("substrate")), having a

desired diameter ("nozzle sizes" col. 10. lines 30-40), supplied with a solution ("material" Col. 6. lines 15-40); ejecting a fluid having smaller diameter toward a surface of the substrate (col. 6. lines 60-65), making the fluid land on the substrate (example fig. 3, Item 100); and solidifying the droplet after the fluid droplet is landed on the substrate (Col. 11. lines 40-60), and droplets/material are deposited layer by layer to form the three-dimensional structure (col. 11. lines 30-60, col. 25. lines 45-65). Danforth et al. also discloses material/droplet solidified after landing on the substrate (col. 11. lines 30-65). Furthermore, it is obvious a position of the nozzle is maintained in Danforth (see Figure 3, item 14).

However, Danforth et al. do not teach: nozzle having inside diameter between 0.01 micrometer to 8 micron and wherein a diameter of the ejected droplet is 15 micron or less; applying a voltage having a prescribed waveform to the needle-shaped fluid-ejection body; wherein the electric line of force is attracted to top of solidified substance of the droplet, and where needle shaped body is a microcapillary tube.

In the same field of endeavor, three dimensional printing system, Sachs et al. teach: ejecting a fluid droplet having an **ultra-fine diameter** from the tip of the nozzle toward a surface of the substrate (col. 4. lines 50-55), **applying a voltage** having a prescribed waveform to the needle-shaped fluid-ejection body ("voltage applied to charging cells" Col. 4. lines 10-25), forming three dimensional printing pattern (example Fig. 1 & 2, col. 3. lines 25-40), wherein the electric line of force is attracted to top of solidified substance of the droplet (col. 4. lines 40-50), and wherein the three dimensional structure is grown by stacking the subsequent flying droplet guided along

electric line of force onto the top of the solidified substance (abstract; col. 4. lines 33-45); wherein the needle-shaped nozzle is a micro-capillary tube (col. 4. lines 60-65).

Therefore, utilizing means of creating droplets of Sachs in teachings of Danforth would result in formation of droplets for use in forming 3D objects.

However, Sach et al. also teaches diameter of the nozzle **is less than 50 micron (col. 5. lines 15-25).** Examiner notes that depending on particular application, using a specific nozzle outlet size would have been obvious to one ordinary skill in the art to form a three dimensional structure. However, Sach et al. do not specifically teach wherein the nozzle inside diameter is 0.01 micron to 8 micron, and wherein a diameter of the ejected droplet is 15 micron or less.

For example, in the same field of endeavor, directed to forming three-dimensional structures at micron-scale features, Gratson et al. discloses forming three dimensional structure by layer-wise (paragraph [0014]) having nozzle size less than 10 micron (paragraph [0013]) and specifically nozzle diameter size at most 1 micron (see claim 47). Gratson et al. also teach an apparatus for depositing ink may be manufactured by connecting a deposition nozzle with a diameter of preferably at least 0.1 microns to at most 10 microns to micropositioner (see paragraph [0029]), and deposition is controlled using piezoelectric which means using voltage (paragraph [0029]). Therefore, similar to applicants invention, specific size nozzle with voltage would create smaller diameter droplets.

It would have been obvious that such nozzle defined by Gratson will control the deposition of ink ([0030]) and prevent ink from covering lower areas and therefore minimize detects. Also as per [0003] Gratson indicates that this type of nozzle will prevent clogging. Furthermore, by combination provided above, at nozzle diameter size 1 micron, and having solution as a material (see paragraph [0005]) provided by Gratson, there would be droplet produced at diameter of 15 micron or less.

For claim 4, Danforth et al. further teach having similar material and solvent: ("particular material may be selected from the group consisting of ceramic materials, elemental metals, metal alloys…" col. 6. Lines 25-40, Col. 8. lines 20-35, "size of the largest particles in the distribution should be substantially smaller than the diameter of the dispensing nozzle" col. 6. lines 60-65). However, Danforth failed to teach the three-dimensional structure is controlled by a volatile property of the droplet ejected from the needle-shaped fluid- ejection body. However, the secondary art, by Sachs teaches ink jet printing (see col. 4. lines 25-35). By definition, ink jet printing forms liquid drop where the solvent immediately evaporates or dries. Thus, by combination the droplets would be solidified, as inks in Sachs.

Claim 6, Danforth et al. further teach: wherein a surface temperature of the substrate is controlled by at least one heating means selected from the group consisting of a Peltier element, an electric heater, an infrared heater, a heater using fluid such as an oil heater, a silicon rubber heater, and a thermistor, that is fixed to the substrate or a substrate supporting body ("voltage current applied to heat substrate" Col. 10. lines 55-60).

Regarding Claim 8, 9, 10, and 11, Danforth et al. further teach: having metal particulates (Col 6. lines 25-40), however, failed to teach solution containing particles, wherein the fluid is a solution containing ultra-fine ceramic particles or sol-gel of ceramic . However, in combination droplets of Sachs are solution of ink, thus one ordinary skill in the art would use solution as opposed to only particles for forming the three dimensional object in Danforth.

For claims 12-13, Danforth et al. further teach: wherein the fluid is a fluid containing at least one solution selected from the group consisting of a solution containing metal particulates, a polymer solution, a solution containing ultra-fine ceramic particles, a sol-gel solution of ceramics, and a low-molecular weight compound solution (Col. 6. lines 25-40).

As for claim 14-16, as disclosed above, Danforth mentioned that nozzle size and shape depends on a particular application (col. 10. lines 25-40). Danforth do not specifically teach wherein a diameter of ejected droplet is 15 micron or less, or 5 micron or less, or 3 micron or less. For example, In the same field of endeavor, directed to forming three-dimensional structures at micron-scale features, Furthermore, by combination provided above, at nozzle diameter size 1 micron, and having solution as a material (inks, see paragraph [0005]) provided by Gratson, there would be droplet produced at diameter of 15 micron or less.

For claims 23-24, Danforth et al. further teach: wherein the dielectric constant of the fluid to be ejected is 1 or more (“low dielectric material” Col. 2. lines 1-5), and

wherein the steps are conducted in an atmosphere having a vapor pressure of the fluid lower than a saturated vapor pressure of the fluid ("holes may be filled with air or vacuum" col. 1. lines 60-67).

8. Claims 7, and 14-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Danforth et al. (US Patent No. 5, 997, 795) in view of Sachs et al. (US Patent No. 5, 807, 437), in view of Gratson (US Patent 2006/0235105 A1), and in further view of Hayes (US Patent No. 6, 114, 187).

For claim 7, Danforth et al. teach: producing a three dimensional structure, arranging a substrate close to a tip of ejection body (example Fig. 3. Items 14 ("print head"), 19 ("substrate")), however failed to teach: wherein a surface temperature of the substrate is control in a range from room temperature to 100 °C.

In the same field of endeavor, method for preparing a chip scale package and product produced by the method, Hayes teaches: wherein a surface temperature of the substrate is controlled in a range of from room temperature to 100 °C (col. 10. lines 10-30).

It would have been obvious to one ordinary skill in the art at the time of the applicant's invention to modify the method of producing three dimensional structure as taught by Danforth et al. Sachs et al. with having to control substrate temperature at a specific range, as taught in Hayes, for the benefit of solidifying the droplet faster, since substrate temperature affect the freezing of the droplet (col. 10. lines 10-25).

Regarding claims 14-16, Danforth et al. teach distribution of the droplet

substantially smaller than the diameter of the dispensing nozzles outlet as to avoid any bridging effect (col. 6. lines 60-65) and nozzle size shape depends on the application of product being made (col. 10. lines 30-40), however fail to teach specifically: wherein a diameter of the ejected droplet is 15 micrometer or less, wherein a diameter of the droplet is 5 micrometer less, wherein a diameter of the droplet is 3 micrometer or less.

In the same field of endeavor, method for preparing a chip scale package and product produced by the method, Hayes teaches: wherein a diameter of ejected droplet is 15 micrometer or less (col. 8. lines 15-25), wherein a diameter of the droplet is 5 micrometer or less (col. 8. lines 15-25), and wherein a diameter of the droplet is 3 micrometer or less (col. 8. lines 15-25).

It would have been obvious to one ordinary skill in the art at the time of the applicant's invention to modify the diameter of the droplet as taught by Danforth et al. with having specific diameter of the droplet, as shown in Hayes for the benefit of having device filled via cone shaped solder column 28 in which the vias act as mold to define the column (col. 8. lines 15-25), and specific use in integrated circuit chip (col. 8. lines 24-27).

For claims 17, 18, and 19, Danforth et al. teach: deposited layer solidify rapidly (col. 12. lubes 40-55). However, Danforth et al. fail to teach specifically: wherein a time required for the droplet to be dried and solidified is 2 seconds or less; wherein the time required for the droplet to be dried and solidified is 1 second or less; wherein the time required for the droplet to be dried and solidified is 0.1 second or less.

In the same field of endeavor, Hayes et al. teach: heating substrate using to

about 75 °C (Col. 5. lines 50-55), for the benefit of freezing the metal alloy which is typically at 220 °C (col. 5. lines 50-55).

It would have been obvious to one having the ordinary skill in the art at the time of the invention to optimize the substrate temperature, and jetting material temperature as taught in Hayes et al. for the benefit solidifying the droplet at specific amount of time, since it has been held that discovering the optimum value of a result effective variable involves only routine skill in the art. *In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).*

Regarding claims 20, 21, 22, Danforth et al. fail to teach: wherein a flying speed of the droplet is 4 m/sec or more; wherein the flying speed is 6 m/sec or more; wherein the flying speed is 10 m/sec of more.

In the same field of endeavor, method for preparing a chip scale package and product produced by the method, Hayes teaches: wherein a flying speed of the droplet is 3 m/sec (col. 10. lines 25-30), and teaches speed of the jetting device is varied with the applied voltage applied to the print-head (col. 5. lines 25-30).

However, Danforth et al. do not teach having flying speed at 4m/sec or more, or 6 m/sec of more.

It would have been obvious to one having the ordinary skill in the art at the time of the invention to optimize the voltage applied to the print-head (col. 5. lines 25-30) in Hayes for the benefit of getting specific speed of the droplet, since it has been held that

discovering the optimum value of a result effective variable involves only routine skill in the art. *In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).*

9. Claim 36 is rejected under 35 U.S. C. 103(a) as being unpatentable over **Danforth et al.** (US patent No. 5, 997, 795) in view of **Sachs et al.** (US Patent No. 5, 807, 437) and in **further view of Gratson** (US Publication 2006/0235105 A1), and in further view either **one of Uchiyama et al. (US patent 4,897, 667) or Hertz (US Patent 3, 916, 421).**

As for claim 36, Danforth, Sachs et al., Gratson disclosed all the limitation as mentioned above, however failed to explicitly teach comprising an electrode within the nozzle.

For example, in the same field of endeavor, ink jet printer in which ink is continuously sprouted through a nozzle and divided into ink droplet, Uchiyama et al. teach further comprising an electrode within the nozzle (col. 4. lines 20-25), for the benefit of controlling the landing of the droplet.

Also, for example, in the same field of endeavor, ink jet printing, Hertz disclose a nozzle having electrode within the nozzle (as shown in 3, item 9, 2) for the benefit of charging droplets out of the nozzle (col. 2. lines 50-65).

It would have been obvious to one ordinary skill in the art at the time of the applicant's invention to modify above, with further having an electrode within the nozzle, as taught by Uchiyama, or Hertz for the same benefit as mentioned above.

Allowable Subject Matter

Claims 5 and 37-40 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 1st paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

For claims 5 and 40, Danforth et al. teach all the limitation to the claimed invention however, failed to teach wherein a temperature of the substrate is controlled in that the previously landed droplet on the substrate is volatilized to be hard enough for the subsequent droplet stacked thereon; wherein the fluid droplet dries and solidifies by evaporation and drying to increase the viscosity of the fluid to allow stacking; wherein the three-dimensional structure has an aspect ratio of 3 or more; wherein the fluid droplet dries and solidifies by evaporation, the evaporation includes volatilization.

Response to Amendment

10. The declaration under 37 CFR 1.132 filed 11/19/2010 is insufficient to overcome the rejection of claims 1, 4-40 based upon 103 rejection (Danforth et al. in view of Sachs et al. and in further view of Gratson) as set forth in the last Office action because:

- The Declaration did not present a comparison with the closest prior art cited (see MPEP 716.02 unexpected results). The comparison must be under identical condition except for the novel features of the invention.
- The scope of the showing must be commensurate with the scope of the claimed subject matter. Applicant failed to show scope of the claimed subject matter comparing with what is in the prior art, and however, only discusses what has been patented (US Patent 7, 434, 912).

- The unexpected property or result must actually be unexpected and of statistical and practical significance.
- Applicant only compares between their own invention from the instant application with the prior US patent 7, 434, 912.
- It is clear that US Patent 7, 434, 912 is allowed for a different reason other than what is claimed in the present invention. The instant claims are distinct and are in different class/subclass.

Response to Arguments

11. Applicant's arguments filed on 11/19/2010 have been fully considered but they are not persuasive:

12. Applicant argued mainly amended claim, that maintaining a position and continually ejecting subsequent droplets using a nozzle diameter of 0.01 micron to 8 micron, and forming droplets of 15 micron. Applicant also argued the combination applied.

13. Examiner showed that Sachs teaches (col. 4, lines 10-40) that voltages serve as means for creating droplets. The primary reference by Danforth is used to show how the droplets are created; therefore utilizing means of creating droplets of Sachs in teaching of Danforth would still result in formation of droplets suitable for use in forming 3D objects.

14. As previously stated, it would have been obvious to one ordinary skill in the art at the time of the applicant's invention to modify Danforth, with further having specific

micro scale nozzle size as taught in Gratson et al., for the benefit of producing three-dimensional structure with micron-scale features (paragraph [0001-0002]). Furthermore, by combination provided above, at nozzle diameter size 1 micron, and having solution as a material (see paragraph [0005]) provided by Gratson, there would be droplet produced at diameter of 15 micron or less.

15. Applicant argued that Gratson is not in the same field of endeavor or does not render the claim obvious. Examiner did not explain or establish prima facie case of obviousness.

16. Examiner would like to take a moment to explain applicant that it is noted above, that Gratson is directed to same field of endeavor, of forming three dimensional structures with micron-scale feature (paragraphs [0001, 0014, 0023, 0029]). It is explicitly stated in the microstructure fabrication is via deposition of inks that flow through a deposition nozzle of 10 micron or less, without clogging (see paragraph [0013]). It is also stated that pattern layers are formed by increment (see paragraph [0014]). Furthermore, it is stated that Gratson also teaches that deposition of ink (material) is preferable with nozzle diameter of 0.1 micron and at most 10 micron (see paragraph [0029]), which is in the range of the instant application.

17. Also, examiner notes that Gratson reference is used to show that a smaller sized nozzle can be used in Danforth. Danforth teaches providing a nozzle having interchangeable size and shape of the dispensing head outlet using various orifice sizes and shapes, or interchangeable orifice inserts in the tip of the nozzle (col. 10. lines 30-40; col. 25. lines 35-65); arranging a substrate close to a tip of fluid-ejection body

(example Fig. 3. Items 14 (“print head"), 19 ("substrate")), having a desired diameter (“nozzle sizes” col. 10. lines 30-40), supplied with a solution (“material” Col. 6. lines 15-40). Therefore, one ordinary skill in the art would modify Danforth, and use a smaller sized nozzle diameter as taught in Gratson, for the benefit of forming micron sized structures.

18. Applicant argues that Danforth discloses a dispenser that has no need for using a specific waveform voltage. There is no disclosure in Danforth that materials are ejected in droplets.

19. Examiner’s response: Examiner disagrees. Danforth et al. also discloses material/droplet solidified after landing on the substrate as in the indirect forming method (col. 11. lines 30-65). Furthermore, it is evident from Danforth that depending on specific type of nozzle head, specific type of structure is formed layer by layer (see col. 25. lines 35-55). Furthermore, Danforth et al. mentions that ink jet printing may also be utilized (col. 25. lines 45-65), and thus , it is well known that in the ink jet printing a waveform voltage can be used as provided by Sachs.

20. Applicant argues that there is no reason to use a nozzle having a diameter of 0.01 micron to 8 micron, to build photonic band gap device that is much bigger that a the nozzle diameter.

21. Examiner’s response: Examiner disagrees. US Publication 2010/0330220 A1 (which claims benefit to Jun 17. 2003 date), shows that a smaller sized nozzle diameter (paragraph [0004]) is used for photonic band gap materials (see paragraph [0002]). This

reference clearly shows that there is a reason to use smaller size nozzle diameter for the indirect method provided in Danforth.

Conclusion

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

23. US Publication 2010/0330220 A1; 2008/0245266 A1; 2005/0160964 A1; 7, 141, 617 B2; 2010/0096596 A1.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NAHIDA SULTANA whose telephone number is (571)270-1925. The examiner can normally be reached on Mon- Fri 9:00 Am -5:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Del Sole can be reached on 571-272-1130. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

NS

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